



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------------|------------------------|
| 10/796,527 | 03/09/2004 | Takao Mori | 112857-478 | 1944 |
| 29175 | 7590 | 06/08/2007 | | |
| BELL, BOYD & LLOYD, LLP P. O. BOX 1135 CHICAGO, IL 60690 | | | EXAMINER BERNARD, VIJI | |
| | | | ART UNIT 1763 | PAPER NUMBER |
| | | | MAIL DATE 06/08/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/796,527

Applicant(s)

MORI ET AL.

Examiner

Viji N. Bernard

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11, 13-16, 18--21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 11, 13-16, 18--21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/21/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

in the claim.

Claims 11, 13-16, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-214682 to Tanamura et al in view of U.S Pub. No: 2001/0006827 A1 to Yamazaki et al.

Regarding Claim 11, Referring to Drawing (4) Tanamura et al teach that manufacturing an organic electroluminescence display, the organic electroluminescence display having a substrate (1), a first electrode layer (2, anode layer) formed on the substrate (1, an organic layer including a plurality of organic material layers (3a-c) (Page 4, Paragraph 0023) stacked on the

first electrode layer in a predetermined pattern and a second electrode layer (4, cathode layer) formed on the organic layer (3c), the apparatus comprising: a first alignment mechanism (In the transfer chamber, Tanamura et al discloses a procedure mechanism for aligning/installing the mask and the substrate, Page 9, Paragraph 0071) for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate (1) and for detachably attaching the mask and the substrate;

Tanamura et al fail to teach that a first formation unit including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a first color position, the substrate being attached to the mask; and a second formation unit including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a second color position, the substrate being attached to the mask, wherein each of the vacuum processing chambers correspond to each of the organic material layers.

However, Yamazaki et al teach that an electromagnetic alignment mechanism comprises a mask support member (207) (Fig 2A, 2B), a substrate support member (204), an attachment fixture support member (electromagnetic field) and a movement mechanism (205a - conveyor rail) for the purpose of aligning a substrate and mask without warping (Page 2,3, Paragraph 0035) and further Yamazaki et al teach that one, two or more film formation chambers (607, 609, 611, 613) including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at one, two or more color position, the substrate being attached to the mask; wherein each of the vacuum processing chambers correspond to each of the organic material layers (Page 5, Paragraph 0063-0068) for the purpose of performing uniform

film thickness at high throughput (Page 2, Paragraph 0016).

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include alignment mechanism and film formation units as taught by Yamazaki et al in order to prevent the substrate from warping and to perform uniform film thickness at high throughput.

Regarding Claim 13, Referring to (Drawing 1) Tanamura et al teach that each of the plurality of vacuum processing chambers (22-26) includes a vapor deposition source for supplying an organic material for forming an organic material layer Drawing (4) (3a-c) (Page 4, Paragraph 0028 and 0040).

Regarding Claim 14, Referring to (Drawing 1) Tanamura et al teach that a vacuum transfer chamber (22a-26a) connecting the vacuum processing chambers (22-26), wherein the transferring mechanism (22b-26b) (Robot) is arranged in the vacuum transfer chamber.

Regarding Claims 15-16, Tanamura et al teach that the substrate is installed on the metal mask but does not expressly teach an attachment fixture includes a magnet plate for attaching the substrate and the mask and the mask is formed of a magnetic material.

However, Yamazaki et al teaches an electromagnet (210) (Fig 2B) is disposed over the substrate and the substrate is set in a substrate holder (204) and shadow mask (208) is made of metallic material and is fixed to a mask holder (207) (Page 2, Paragraph 0034).

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include an electromagnet as taught by Yamazaki et al so that a magnetic field is formed by the electromagnet, the shadow mask is drawn to the substrate so as to maintain a predetermined gap

(page 2, Paragraph 0034).

Regarding Claim 18, the alignment mechanism provided in Yamazaki et al as described above can be used as alignment or separating mechanism. Also, it can be placed in any transfer chamber including a transfer chamber connected to a vacuum processing chamber for depositing an anode or cathode.

Yamazaki et al and Tanamura et al teach that providing a vacuum chamber connected to a transfer chamber for depositing anode and cathode layer, Yamazaki teaches without a mask (Page 4, Paragraph 0051).

Regarding Claim 19, Tanamura et al teach that the substrate is installed on the metal mask arranged before hand but does not expressly teach the details of alignment mechanism.

However, Yamazaki et al teach that an electromagnetic alignment mechanism comprises a mask support member (207) (Fig 2A, 2B), a substrate support member (204), an attachment fixture support member (electromagnetic field) and a movement mechanism (205a - conveyor rail) for the purpose of aligning a substrate and mask without warping (Page 2,3, Paragraph 0035).

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include an electromagnet, a substrate holder and a mask holder, an electromagnetic field and a conveyor rail as taught by Yamazaki et al in order to prevent the substrate from warping when held by the alignment mechanism.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-214682 to Tanamura et al in view of U.S Pub. No: 2001/0006827 A1 to Yamazaki et al as

applied to claims 11, 13-16, 18-19 above, and further in view of U.S Patent. No: 4,917,556 to Stark et al

Regarding Claim 20, Tanamura et al teach that the apparatus of the invention substantially as claimed.

But Tanamura et al fail teach that a loading unit including a plurality of vacuum processing chambers, the plurality of vacuum processing chambers including the first alignment chamber, wherein the loading unit is connected in series with the first formation unit by a transfer chamber, thereby providing flow-through processing

However, Stark et al teach that a wafer transport and processing system provides a first and second alignment mechanism and are connected to the processing module in series thereby providing flow-through processing and is configured to perform the alignment changes in a vacuum atmosphere (Fig. 3, 50a, 50b, flat aligner, Col. 5, Line 35-40, Col. 5, Line 66 and 30b, 30c, 30f, 30g, process module/process chambers, Col. 5, Line 27-28, Line 54-55) for the purpose of positioning a wafer in a desired rotational orientation.

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include first and second alignment mechanism as taught by Stark et al in order to position a wafer in a desired rotational orientation.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-214682 to Tanamura et al in view of U.S Pub. No: 2001/0006827 A1 to Yamazaki et al as applied to claims 11, 13-16, 18-19 above, and further in view of U.S Patent. No: 5,310,410 to Begin et al.

Regarding Claim 21, Tanamura et al teach that the apparatus of the invention substantially as claimed.

Tanamura et al fail to teach that a series of film formation units includes plurality of processing chambers.

However, Begin et al teach that a first formation unit including a plurality of vacuum processing chambers (38, 40, 42) (Fig 3) for sequentially forming the organic material layers on the substrate at a first color position, the substrate being attached to the mask and a second formation unit (80, 82, 84) including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a second color position are disposed in a satellite relationship around the central chambers (14, 72) for the purpose of performing multiple manufacturing processes in a single flexible apparatus (abstract) (Col 2, Line 6-7, Col. 1, Line 25-60, Col. 3, Line 66-68, Col. 5, Line 31-33)

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include plurality of first and second formation units around the central chambers as taught by Begin et al in order to perform multiple manufacturing processes in a single flexible apparatus.

Claims 11, 20, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-214682 to Tanamura et al in view of U.S Patent. No: 5,695,564 to Imahashi.

Regarding Claim 11, 20, 21, Referring to Drawing (4) Tanamura et al teach that manufacturing an organic electroluminescence display, the organic electroluminescence display having a substrate (1), a first electrode layer (2, anode layer) formed on the substrate (1, an organic layer including a plurality of organic material layers (3a-c) (Page 4, Paragraph 0023)

stacked on the first electrode layer in a predetermined pattern and a second electrode layer (4, cathode layer) formed on the organic layer (3c), the apparatus comprising: a first alignment mechanism (In the transfer chamber, Tanamura et al discloses a procedure mechanism for aligning/installing the mask and the substrate, Page 9, Paragraph 0071) for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate (1) and for detachably attaching the mask and the substrate;

Tanamura et al fail to teach that a first formation unit including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a first color position, the substrate being attached to the mask; and a second formation unit including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a second color position, the substrate being attached to the mask, wherein each of the vacuum processing chambers correspond to each of the organic material layers, and wherein the second alignment mechanism is provided to connect the first formation unit and the second formation unit in series thereby providing flow-through processing, and is configured to perform the alignment changes in a vacuum atmosphere and a Loading unit including a plurality of processing chambers, the plurality of processing chambers including the first alignment chamber, wherein the loading unit is connected in series with the first formation unit by a transfer chamber, thereby providing flow-through processing and a third formation unit including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a third color position, the substrate being attached to the mask; and a third alignment chamber connecting the second formation unit to the third

formation unit; wherein the first formation unit, the second alignment chamber, the second formation unit, the third alignment chamber, and the third formation unit are connected in series.

However, Imahashi teaches that a first alignment mechanism (Fig. 8, U3a) for aligning a mask, having openings corresponding to the predetermined pattern, to the substrate and for detachably attaching the mask and the substrate; a first formation unit (U1a) including a plurality of vacuum processing chambers (U2a, U3a, U4a) for sequentially forming of the organic material layers on the substrate at a first color position, the substrate being attached to the mask; and a second alignment mechanism (U3b) for changing the alignment between the substrate and the mask, and for detachably attaching the substrate and the mask again; and a second formation unit (U1b) including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a second color position, the substrate being attached to the mask, wherein each of the vacuum processing chambers correspond to each of the organic material layers, and wherein the second alignment mechanism (U3b) is provided to connect the first formation unit (U1a) and the second formation unit (U1b) in series thereby providing flow-through processing, and is configured to perform the alignment changes in a vacuum atmosphere, and a loading unit (U4a) including a plurality of processing chambers, the plurality of processing chambers including the first alignment chamber (U3a), wherein the loading unit is connected in series with the first formation unit (U1a) by a transfer chamber (U2a), thereby providing flow-through processing and a third formation unit (U1c) including a plurality of vacuum processing chambers for sequentially forming the organic material layers on the substrate at a third color position, the substrate being attached to the mask; and a third alignment chamber (U3c) connecting the second formation unit (U1b) to the third formation unit (U1c); wherein the first

formation unit (U1a), the second alignment chamber (U3b), the second formation unit (U1b), the third alignment chamber (U3c), and the third formation unit (U1c) are connected in series (Fig. 8) (a multi chamber processing system includes plurality of process chambers (transfer, loading, unloading and alignment chambers) and are connected in series (Fig. 1, 2, 8, 9, 10) (U1 (U1a, U1b, U1c, U1d), U5, process units/1st, 2nd, 3rd, 4th film formation units, U2 (U2a, U2b, U2c, U2d), U6, transfer units, U3 (U3a, U3b, U3c), U7, a linear interconnection unit/1st, 2nd, 3rd alignment unit, U4 (U4a, U4b), U8, wafer storing in/out units or 1st, 2nd loading/unloading units) for the purpose of designing freely and arranging according to the type and numbers of process steps or an installation space, without greatly increasing costs and avoiding cross contamination and alignment chambers are used for adjusting the position of wafers (Col. 1, Line 10-15, Col. 2, Line 24-27, Line 40-41, Line 60-67, Col. 3, Line 20-30, Line 55-60, Col. 4, Line 55-67, Col. 5, Line 1-10, Line 63-67, Col. 6, Line 1-67, Col. 7, Line 1-9, Col. 9, Line 36-59))

Thus, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Tanamura et al so as to include plurality of first and second formation units and alignment units around the central chambers are connected in series as taught by Imahashi in order to design freely and arrange according to the type and numbers of process steps or an installation space, without greatly increasing costs and avoid cross contamination and alignment chambers are used for adjusting the position of wafers.

Response to Arguments

Applicant's arguments filed 04/06/2007 have been fully considered.

The arguments are not persuasive because alignment chamber can be used for aligning a

mask or aligning a substrate or aligning between a substrate and a mask or positioning the substrate, etc., so it can be used for any type of alignment performed before the device enters into first chamber or after the device coming out from first or second or any processing unit.

Applicant has argued that Tanamura fails to disclose a second alignment mechanism that is provided to connect the first formation unit and the second formation unit in series. If you have one set of film formation unit and it has plurality of processing chambers (includes alignment chamber, loading chamber, pre-treatment chamber, transfer chamber, cleaning chamber etc,) then we can connect many units like second formation unit, second alignment unit, third formation unit, third alignment unit etc, that is possible.

Applicant has argued that Begin is not properly combinable with the remaining references because Begin is directed to an apparatus for processing wafers which are fabricated to provide semi-conductor chips.

Any type of substrates can be processed in film formation units, whether it is organic electroluminescence display device substrate or semiconductor chip or semiconductor wafer. The method and way of processing is same for all kind of substrates, depending on the substrate, the processing conditions may differ but the apparatus is same.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No: 6,132,280, U.S. Patent No: 6,776,880 B1 and U.S. Pub No: 2005/0005850 A1 discloses multiple chambers, U.S. Patent No: 5,259,881 discloses wafer

processing cluster tool with alignment chamber, EP 1035576 A2 discloses a processing method of silicon epitaxial growth and a processing apparatus including an alignment chamber.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viji N. Bernard whose telephone number is 571-272-6425. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Viji Bernard
Examiner
Art Unit 1763


Ram Kackar
Primary Examiner
Art Unit 1763